

## **2011 Addendum to the Upper Tippecanoe Watershed Management Plan**

In 2008, the Tippecanoe Environmental Lake and Watershed Foundation (TELWF) revised its name to the Tippecanoe Watershed Foundation (TWF).

In 2006, the Tippecanoe Watershed Foundation received a Lake and River Enhancement (LARE) grant from the Indiana Department of Natural Resources (IDNR) for the development of a Watershed Management Plan (WMP)/Diagnostic Study for the seven lakes in the uppermost part of the Tippecanoe watershed. The lakes include Big, Crane, Crooked, Old, New, Goose, and Loon. These lakes are represented by the Upper Tippecanoe River Lakes Association (UTRLA). In the 2006 WMP, many Loon, Goose, Crooked and Big lakes sites were incorporated into the Smalley Watershed's critical areas list. The addendum strives to more accurately reflect the true location of the critical areas within smaller demographical subwatersheds.

The UTRLA Watershed Management Plan was completed by Williams Creek Consulting, Inc. in cooperation with Commonwealth Biomonitoring and Empower Results, LLC in July 2008. This plan resulted in the development of site specific recommendations for critical areas in two subwatersheds (Loon/Goose and Big/Crooked).

In addition, TWF developed a Technical Advisory Committee (TAC) in 2008 to provide annual review of the Watershed Management Plan, develop a reporting process, and make revisions. The TAC met in December 2008 and December 2009 (participant list attached). TAC participants provided updates on conservation practices and projects that had been recently completed in the watershed. They reviewed the critical areas, suggested projects for removal or addition, and recommend priority projects from among the list.

Given this new data, analysis and feedback, the Tippecanoe Watershed Foundation is prepared to update Section 5.0 G "Priority Areas" from the 2006 Watershed Management Plan. This document replaces pages 5.81-5.88 and 5.91-5.97 of the WMP written by JF New and approved by IDEM in 2006.

### **Projects to be Removed from Critical Areas List**

Several BMP implementation projects from the 2006 Watershed Management Plan (WMP) have been completed by TWF or partner organizations and agencies and shall be removed from the critical areas list. In addition, several of the projects listed in the 2006 WMP do not meet the specifications for a critical area and will be removed from the list.

#### **Smalley Subwatershed (HUC 051201060103 (northwestern portion)) (WMP2006 p5.81)**

- No changes

#### **Ridinger / Robinson Subwatershed (HUC 051201060102) (WMP2006 p5.83)**

- Identify sources of high cadmium levels in Ridinger tributaries (IST, 1990) (6<sup>th</sup> bullet) - *not applicable*
- Restricting access of livestock to Robinson Lake. An alternate source of water should be created for the livestock, and the lake shoreline where the livestock have grazed should be restored. Ideally, a

constructed wetland or other treatment of drainage from the livestock's pasture should be installed to limit nutrient input to Robinson Lake (JFNew, 04) (8<sup>th</sup> bullet) – *completed*

- Restoration of Troy Cedar Lake's northern inlet's corridor where ditch cleaning has damaged the riparian zone. Restoration may include stream bank stabilization through the use of bioengineering techniques and revegetation of the riparian corridor, preferably with woody vegetation (New, 2004) (10<sup>th</sup> bullet). – *Moved to Elder Subwatershed*

#### **Loon / Goose Subwatershed (HUC 051201060103(southwestern portion)) (WMP2006 p5.85)**

- Conduct a current, more detailed diagnostic study of this subwatershed to develop site specific recommendations (Williams Creek, 2005). (2<sup>nd</sup> bullet)- *completed*

#### **Elder Ditch Subwatershed (HUC 051201060101) (WMP2006 p5.86)**

- Restore the wetland north of County Road 300 N. and east of County Road 650 W. (7<sup>th</sup> bullet) – *completed*
- Restrict livestock access to the Troy Cedar Branch of Elder Ditch on the east and west sides of CR 550W. An alternate source of water should be created for the livestock, and the stream bank where the livestock have grazed should be restored. This may include stabilizing or reconstructing the banks using bioengineering techniques. (New, 2004) (Ridinger Robinson 12<sup>th</sup> bullet)- *completed*

#### **Webster / Backwaters Subwatershed (HUC 051201060105(eastern portion)) (WMP2006 p5.87)**

- Restore two wetland filters at the headwater of Gaff Ditch; CR 750 N & CR 650 W (New, 2000) (2<sup>nd</sup> bullet)- *completed*
- Install filter strips and grassed waterways on the unnamed tributary to Gaff Ditch east of CR 750 W. at CR 400 S. (6<sup>th</sup> bullet) - *completed*
- Selectively dredge the inlets to Webster Lake (New, 2000) (10<sup>th</sup> bullet)- *completed*

#### **Barbee Lakes Subwatershed (HUC 051201060104) (WMP2006 p5.91)**

- Install filter strips; fence pastures adjacent to Grassy Creek between Ridinger and Barbee Lakes (New, 2000) (1<sup>st</sup> bullet). - *completed*
- Install grass/forested buffer at the southwest corner of County Road 650 E. and County Road 200 N. (New, 2000) (2<sup>nd</sup> bullet). - *completed*
- Selectively dredge sediment in Little Barbee Lake and its channels (Hippensteel, 1988) (7<sup>th</sup> bullet) – *completed*
- Reduce phosphorus loading from Ridinger Lake (Hippensteel, 1988) – *refers to areas in the Ridinger/Robinson and Elder Subwatersheds*
- Install comprehensive sanitary sewer system (New, 2000). (9<sup>th</sup> bullet) – *in progress*

#### **Lake Tippecanoe Subwatershed (HUC 051201060105(western portion)) (WMP2006 p5.93)**

- Address E. coli, phosphorus and nitrogen inputs from the northwest corner of County Road 500 E and County Road 650 N (New, 1997) (2<sup>nd</sup> bullet). – *completed*

#### **Crooked / Big Subwatershed (HUC 051201060103(eastern portion)) (WMP2006 p5.96)**

- Conduct a current, more detailed diagnostic study of this subwatershed to develop site specific recommendations. (1<sup>st</sup> bullet)- *completed*

## Critical Areas to be Completed

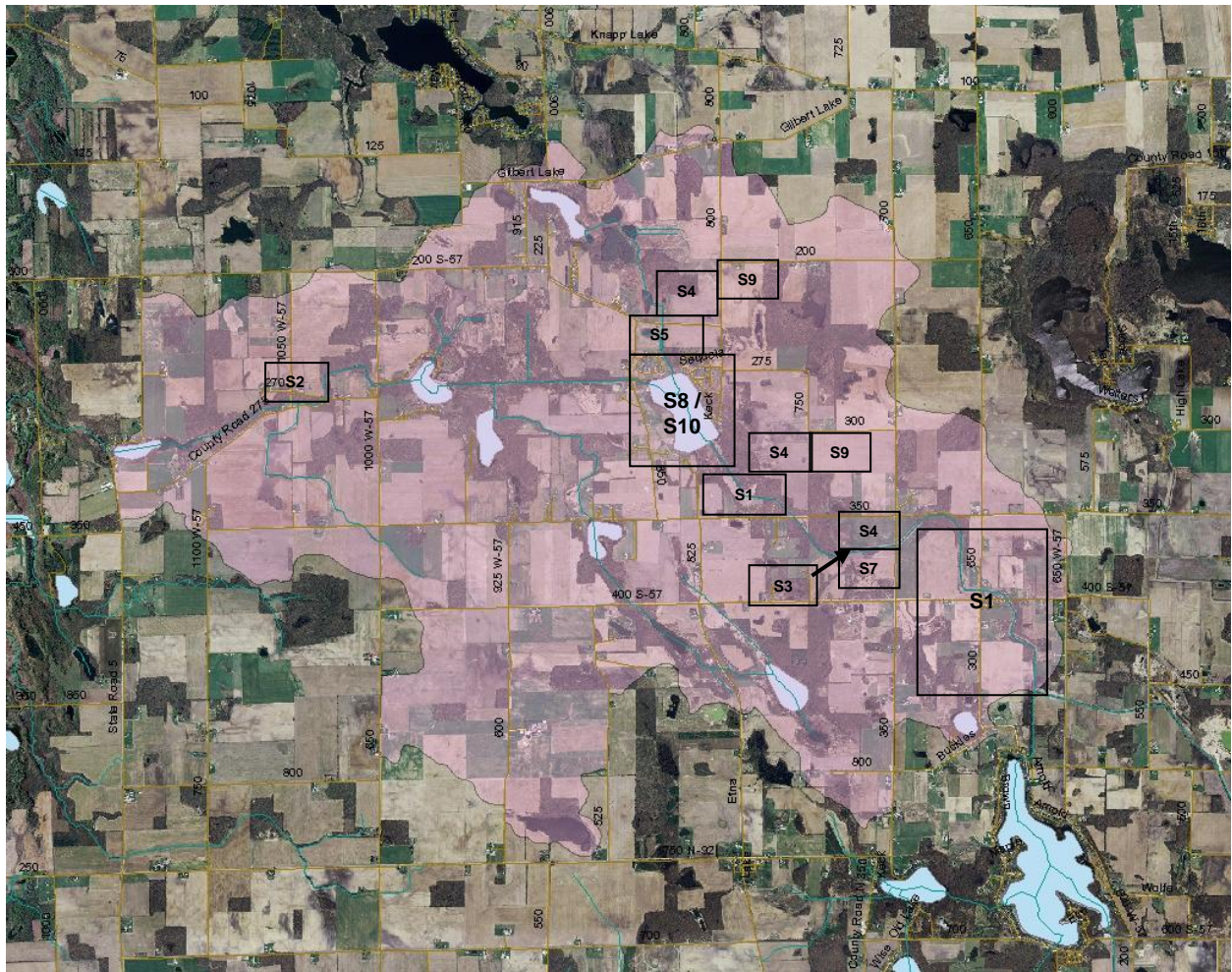
The critical areas are focused in previously-identified priority subwatersheds and/or specific subwatershed hot spots as determined by various diagnostic studies and technical expert advisement.

This current updated list includes critical areas identified in the 2006 Watershed Management Plan, as well as new areas identified by TWF, natural resource professionals, or members of the Technical Advisory Committee (TAC).

### Smalley Subwatershed (HUC 051201060103(northwestern portion)) (WMP2006 p5.81)

- S1) Install buffer strips along the Tippecanoe River from Big Lake west to Smalley Lake (JFNew, 2000) (1<sup>st</sup> bullet).
- S2) Fence cattle from the stream near County Road 1050 W. and County Road 275 S. and construct watering pond as an alternative water source (JFNew, 2000) (2<sup>nd</sup> bullet).
- S3) Restore riparian zones along the Tippecanoe River and its tributaries where possible; minimally, install filter strips along the Tippecanoe River and its tributaries. Target areas shown on subwatershed map first. (JFNew, 2004) (3<sup>rd</sup> bullet).
- S4) Restore as many wetlands as possible in the Smalley Lake watershed, focusing first on the Tippecanoe River subwatershed and targeting those areas shown on subwatershed map first. Watershed stakeholders should try to restore wetland acreage so that the percentage of the Smalley Lake watershed covered by wetlands equals or exceeds the percentage of land in the greater Upper Tippecanoe River basin that is covered by wetlands. (JFNew, 2004) (4<sup>th</sup> bullet).
- S5) Install fencing to protect Smalley Lake's northern inlet from grazing cattle. Install an alternative water source if necessary. Restore the riparian zone where grazing cattle have damaged the stream habitat. Consider directing drainage from an adjacent grazed field through a constructed wetland to reduce nitrate inputs to the northern inlet. (JFNew, 2004) (5<sup>th</sup> bullet).
- S6) Increase the usage of no-till conservation tillage on corn fields in the Smalley subwatershed. (New, 2004) (6<sup>th</sup> bullet)
- S7) Implement grassed waterways and remove land mapped in highly erodible soils from agricultural production. Target areas shown on subwatershed map first (JFNew, 2004) (7<sup>th</sup> bullet). - **Modified to remove "CRP" as the only technique.**
- S8) Monitor and improve erosion control techniques on residential and commercial development sites less than one acre in size. Bring areas of concern to appropriate authorities. Work with landowners to install BMP's such as silt fences, berms, diversions, and construction drives. Management efforts should focus on Smalley Lake where the active construction sites exist and lack of erosion control techniques were observed (JFNew, 2004) (8<sup>th</sup> bullet).
- S9) Plant vegetative filter areas around unprotected risers shown on subwatershed map first. (JFNew, 2004) (9<sup>th</sup> bullet).
- S10) Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**





Smalley Subwatershed Critical Areas

## **Ridinger / Robinson Subwatershed (HUC 051201060102) (WMP2006 p5.83)**

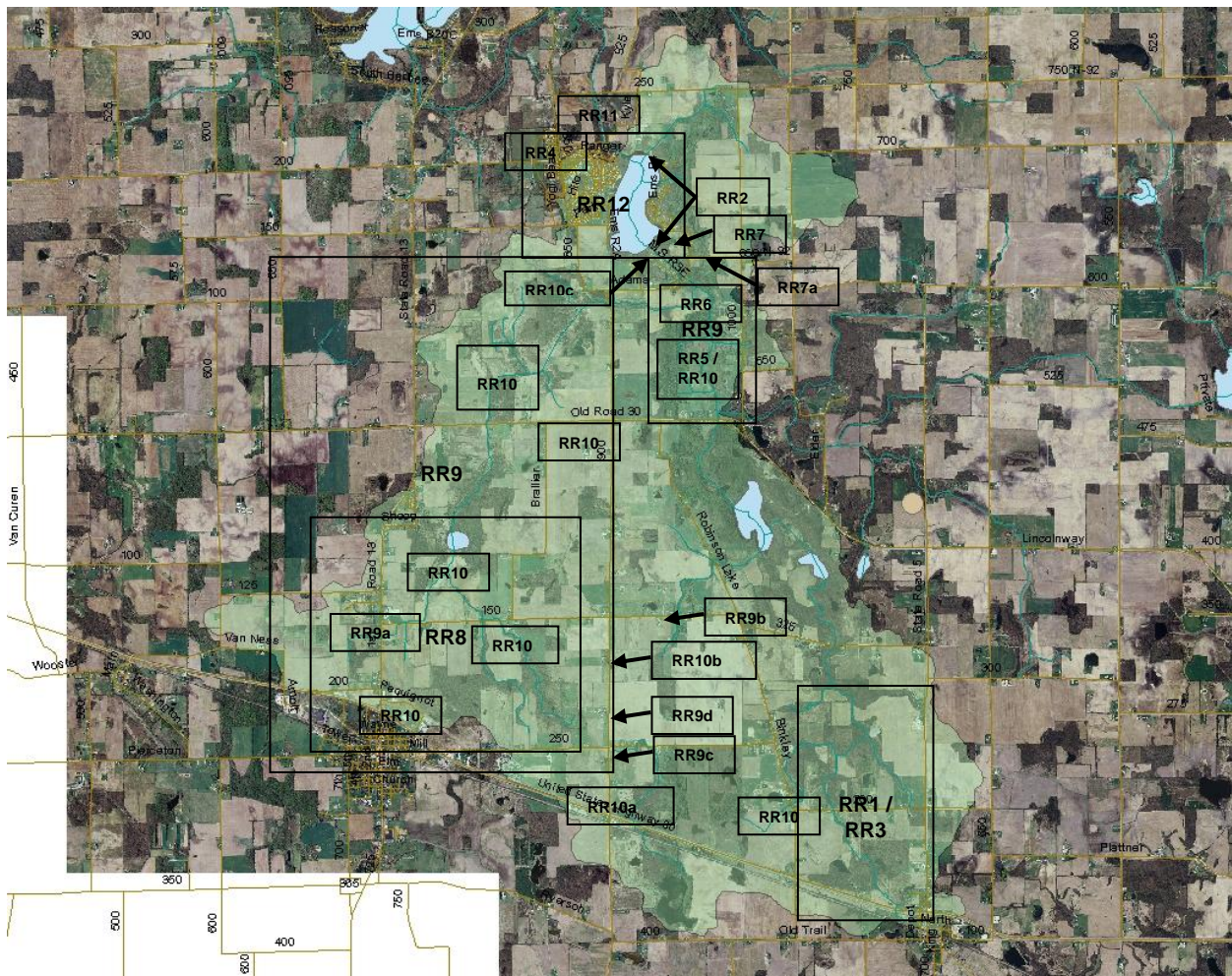
- RR1)** Create wetland habitat, install buffer strips/grassed waterways to reduce flow and retire agricultural land upstream of Rine Lake (New, 2000) (1<sup>st</sup> bullet).
- RR2)** Selectively dredge the sandbars near mouths of both major inlets at Ridinger Lake (International Science and Technology(IST), 1990) (2<sup>nd</sup> bullet).
- RR3)** Install filter strips along Mathias Ditch (St. Clair, personal communication) (3<sup>rd</sup> bullet).
- RR4)** Develop materials to distribute on “Lake Basics” to be given to tenants upon their arrival at Jellystone Park regarding trash, fertilizers, chemicals, automobile traffic, grass and leaves, boating, etc. (IST, 1990) (4<sup>th</sup> bullet).
- RR5)** Wetland restoration on Elder Ditch, north of Old 30 and East of 900 E. (USACE, 1995) (5<sup>th</sup> bullet)
- RR6)** Restoration of the Elder Ditch corridor where ditch cleaning has been particularly damaging such as the area upstream and downstream of Elder Road. Restoration in this area includes stream bank stabilization through the use of bioengineering techniques and re-vegetation of the riparian corridor, preferably with woody vegetation (JFNew, 2004) (7<sup>th</sup> bullet).
- RR7)** Stabilization of the eroding ravine leading to the southeast corner of Ridinger Lake. Work at this site will include working with the property owner of the adjacent land to utilize grassed waterways or set aside a portion of the land in CRP (JFNew, 2004) (9<sup>th</sup> bullet).
  - a) Install grade stabilization and grassed waterway on the Ivan Wertsler property at the gully on the N. side of Adams Rd, West of Co. Line (Personal correspondence from Sam St.Clair, NRCS, 2010)
- RR8)** Restricting access of livestock to Shanton Ditch’s headwaters tributaries. An alternate source of water should be created for the livestock, and the stream bank where the livestock have grazed should be restored. This may include stabilizing or reconstructing the banks using bioengineering techniques. If possible, drainage from the land where the livestock are pastured should be directed to flow through a constructed wetland to reduce pollutant loading particularly, nitrate-nitrogen loading, to the adjacent stream (New, 2004) (11<sup>th</sup> bullet).
- RR9)** Restore riparian zones along the streams in the Ridinger Lake watershed where possible; minimally, install filter strips along these streams. Stream corridors in the Shanton Ditch and Elder Ditch subwatersheds should receive high priority (JFNew, 2004) (13<sup>th</sup> bullet).
  - a) Install bank stabilization and buffer or two stage ditch on Shanton Ditch (Personal correspondence from Sam St.Clair, NRCS, 2010)
  - b) Encourage or cost-share Wascob repair, cover crop, or critical areas re-vegetation along Doke Ditch (Personal correspondence from Sam St.Clair, NRCS, 2010)
  - c) Encourage or cost-share grassed waterway or similar BMP near 900 E & 250S on Shanton Ditch (Personal correspondence from Sam St.Clair, NRCS, 2010)
  - d) Encourage or cost-share grassed waterway or similar BMP near 900 E & south of 150 S (Personal correspondence from Sam St.Clair, NRCS, 2010)
- RR10)** Restore as many wetlands as possible in the Ridinger Lake watershed, targeting those areas shown on subwatershed map first. (JFNew, 2004) (14<sup>th</sup> bullet).



- a) Restore wetland near 900 E & US 30 on Shanton Ditch. (Personal correspondence from Sam St.Clair, NRCS, 2010)
- b) Restore wetland on the Jim Argerbrite property (Personal correspondence from Sam St.Clair, NRCS, 2010)
- c) Restore wetland on the SE Corner of Ridinger (Personal correspondence from Sam St.Clair, NRCS, 2010)

**RR11)** Reduce phosphorus loading into Ridinger Lake (Hippensteel, 1988) (*Barbee Lakes 8<sup>th</sup> bullet*).

**RR12)** Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**

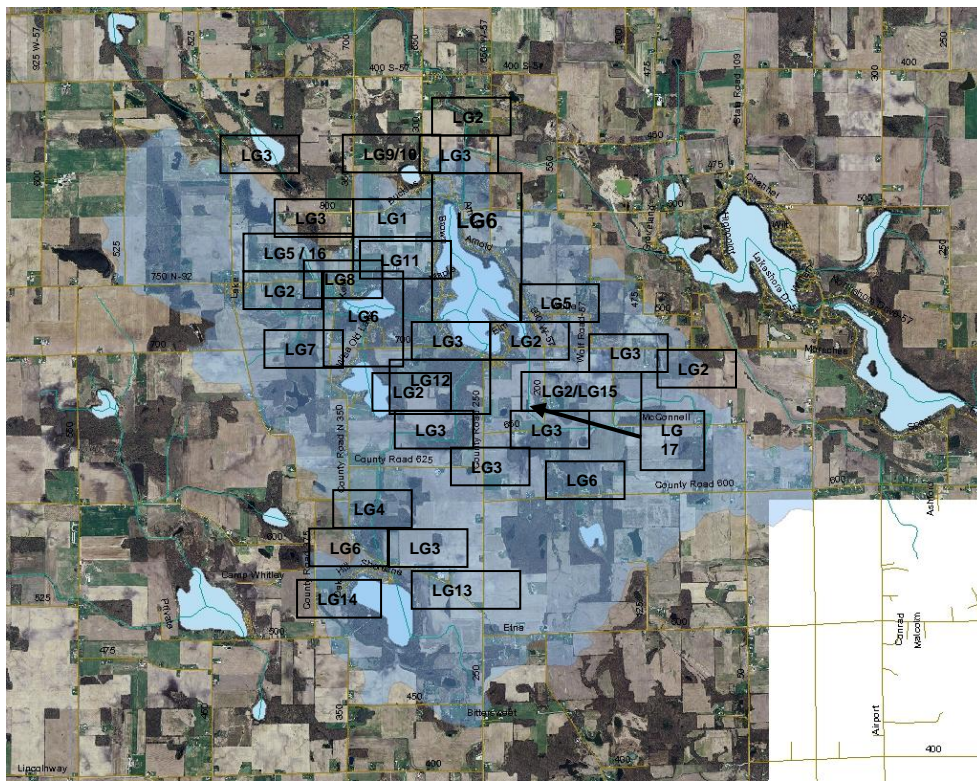


Ridinger / Robinson Subwatershed Critical Areas

**Loon / Goose Subwatershed (HUC 051201060103(southwestern portion)) (WMP2006 p5.85)(UTRLA2008 Fig 49, Fig50) \*(In the 2006 WMP, priority areas identified the Smalley Watershed's critical areas list were actually in the Loon / Goose Subwatershed)**

- LG1) Work with livestock owners to develop waste storage structures throughout the Loon Lake Watershed (Browne, 1992) (1<sup>st</sup> bullet).
- LG2) Restore riparian zones along the Tippecanoe River and its tributaries where possible; minimally, install filter strips along the Tippecanoe River and its tributaries. Target areas shown on subwatershed map first. (JFNew, 2004) (*Smalley Watershed 3<sup>rd</sup> bullet*).
- LG3) Restore as many wetlands as possible in the Smalley Lake watershed, focusing first on the Tippecanoe River subwatershed and targeting those areas shown on subwatershed map first. (JFNew, 2004) (*Smalley Watershed 4<sup>th</sup> bullet*).
- LG4) Implement grassed waterways and remove land mapped in highly erodible soils from agricultural production. Target areas shown on subwatershed map first. (JFNew, 2004) (*Smalley Watershed 7<sup>th</sup> bullet*). – *Modified to remove “CRP” as the only technique*
- LG5) Plant vegetative filter areas around unprotected risers shown on subwatershed map first. (JFNew, 2004) (*Smalley Watershed 9<sup>th</sup> bullet*).
- LG6) Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers (TAC, 2009) – **NEW AREA**
- LG7) Construct grassed waterways starting with the areas indicated on the map first. (*UTRLA WMP p.116,117 and Fig 53, 54*) – **NEW AREA**
- LG8) Construct a sediment trap along the Old Lake north inlet. (*UTRLA WMP p.116,117 and Fig 53*) – **NEW AREA**
- LG9) Construct a buffer area and bio retention filter / raingarden on north inlet to Loon Lake. (*UTRLA WMP p.116,117 and Fig 54*) – **NEW AREA**
- LG10) Work with livestock owners to encourage rotational grazing starting with area indicated on the map first. (*UTRLA WMP p.116,117 and Fig 54*) – **NEW AREA**
- LG11) Work with landowner to enroll property in a conservation easement starting with the areas indicated on the map first. (*UTRLA WMP p.116,117 and Fig54*) – **NEW AREA**
- LG12) Install buffer strips along both sides of Winter’s Ditch between 625 N and 700 N. and 3 WASCObS (*UTRLA WMP p.116,117 and Fig 54*) – **NEW AREA**
- LG13) Install buffer strips along Goose Lake inlet on east shore. (*UTRLA WMP p.116,117 and Fig 54*) – **NEW AREA**
- LG14) Install buffer strips along Goose Lake’s southwestern shore. (*UTRLA WMP p.116,117 and Fig 54*) – **NEW AREA**
- LG15) Construct buffer strips on Friskney Ditch to the west of the 90 degrees bend on McConnell Road. (*UTRLA WMP p.116,117 and Fig 55*) – **NEW AREA**
- LG16) Install streambank stabilization on the north inlet to Old Lake. (TAC, 2009) – **NEW AREA**
- LG17) Install and maintain a sediment trap along the south inlet to Loon Lake. (*UTRLA WMP p.116,117 and Fig 55*) – **NEW AREA**





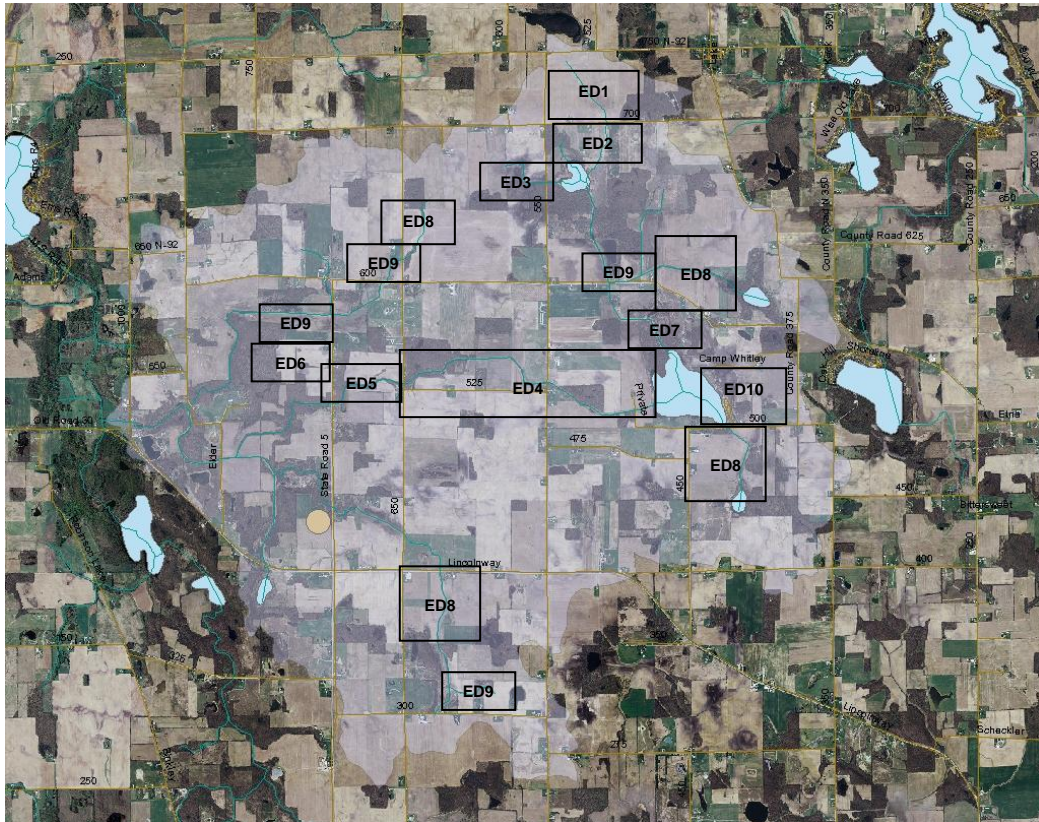
Loon / Goose Subwatershed Critical Areas

### Elder Ditch Subwatershed (HUC 051201060101) (WMP2006 p5.86)

- ED1) Restore 120-acre wetland north of County Road 700 N. and east of County Road 550 W (1<sup>st</sup> bullet).
- ED2) Restore 40-60 acres of wetland south of County Road 750 N. and east of County Road 550 W. (2<sup>nd</sup> bullet).
- ED3) Install filter strips on the western tributary to Scott Lake (3<sup>rd</sup> bullet).
- ED4) Install filter strips, fence cattle from the stream and stabilize the stream bank of the Cedar Lake Branch of Elder Ditch east of County Road 650 W to Troy Cedar Lake. (4<sup>rd</sup> bullet).
- ED5) Install filter strips west of County Road 650 W. on the Cedar Lake Branch of Elder Ditch (5<sup>th</sup> bullet).
- ED6) Enroll property south of Smith Drain along the west side of SR 5 in CRP or WRP. (6<sup>th</sup> bullet)
- ED7) Restoration of Troy Cedar Lake's northern inlet's corridor where ditch cleaning has damaged the riparian zone. Restoration may include stream bank stabilization through the use of bioengineering techniques and re-vegetation of the riparian corridor, preferably with woody vegetation (JFNew, 2004) (*Ridinger/Robinson 10<sup>th</sup> bullet*).
- ED8) Reduce phosphorus loading into Ridinger Lake (Hippensteel, 1988) (*Barbee Lakes 8<sup>th</sup> bullet*).

**ED9)** Restore as many wetlands as possible in the Elder Ditch subwatershed. (TAC, 2009) – **NEW AREA**

**ED10)** Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**

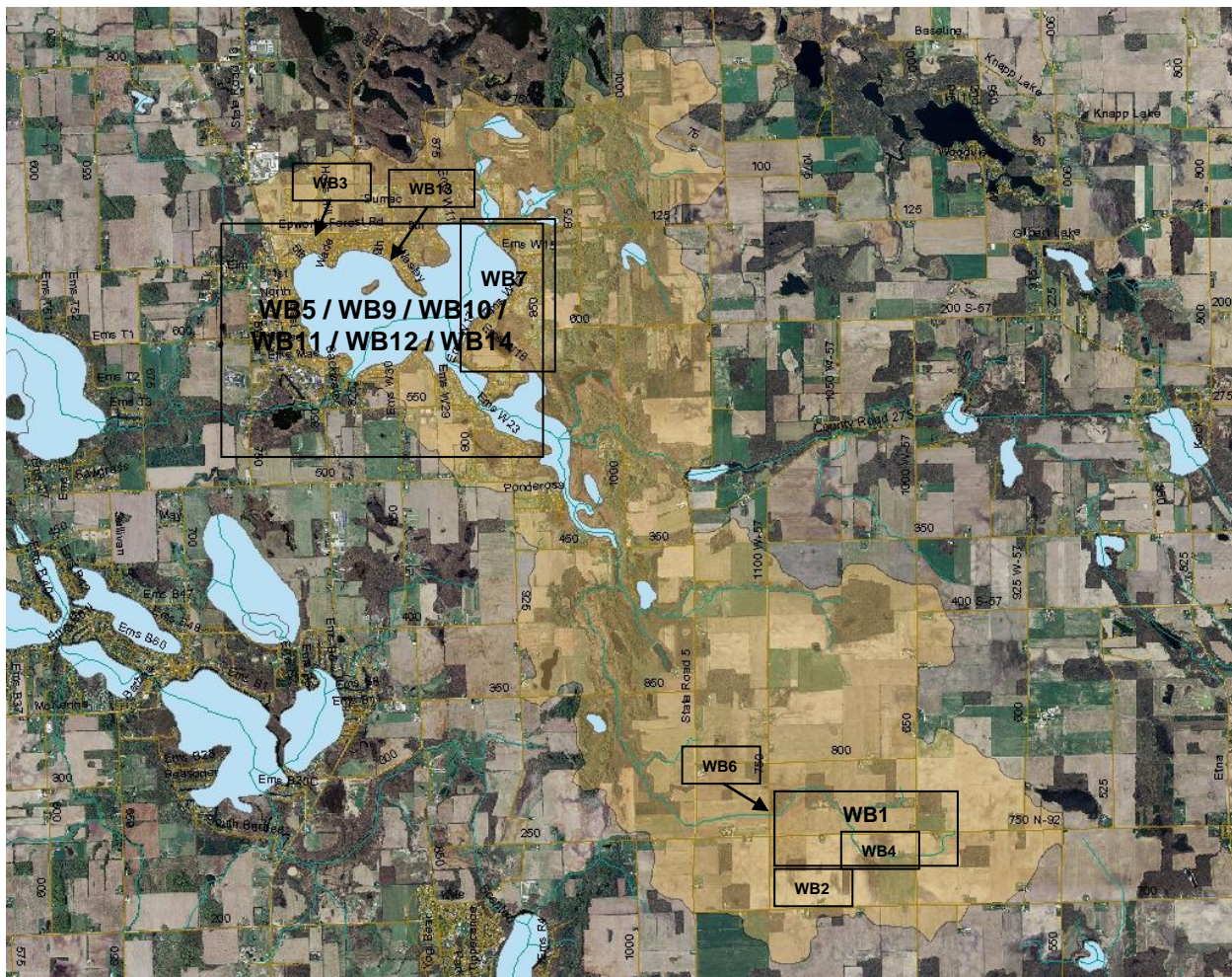


Elder Ditch Subwatershed Critical Areas

**Webster / Backwaters Subwatershed (HUC 051201060105 (eastern portion)) (WMP2006 p5.87)**

- WB1)** Install buffer strips along Gaff Ditch from County Road 750 W. to its headwaters (New, 2000) (1<sup>st</sup> bullet).
- WB2)** Restore wetland or tributary to Gaff Ditch between County Road 700 N and County Road 750 N (3<sup>rd</sup> bullet).
- WB3)** Stabilize stormwater inlets, outlet, and channel banks south of East Street on the northwest corner of Webster Lake. (4<sup>th</sup> bullet)
- WB4)** Install grassed waterways on agricultural land southeast of County Road 650 W and County Road 750 N (Cormany Farms). (5<sup>th</sup> bullet)
- WB5)** Install pollutant removal devices on the 18 stormwater drain complexes located in the city of North Webster and develop a maintenance plan for each of these filters (New, 2000 and 2002) (7<sup>th</sup> bullet).
- WB6)** Stabilize banks adjacent to bridge abutments over Gaff Ditch at County Road 750 W off of 750 N (New, 2000) (8<sup>th</sup> bullet).
- WB7)** Complete the installation of sanitary sewers along east side of Webster Lake. (New, 2000) (9<sup>th</sup> bullet).
- WB8)** Work with the County on long range plan for County Road 750 N (New, 2000) (11<sup>th</sup> bullet).
- WB9)** Continue to work with the Town Council to ensure that a storm drain inspection and maintenance plan is implemented (New, 2002) (12<sup>th</sup> bullet).
- WB10)** Work with the Town Council to determine if drain retrofitting is desirable given available resources. Depending on available resources, other funding sources or grants should be secured to retrofit at least the high priority drain networks (New, 2002) (13<sup>th</sup> bullet).
- WB11)** Have a representative present at monthly town council meetings to ensure better long-term communication regarding the storm drain project and other lake conservation projects (New, 2002) (14<sup>th</sup> bullet).
- WB12)** Initiate an information and education program to inform town and lake residents about practices they can utilize to control sources of pollutants and debris before they are introduced into the storm drain system (New, 2002) (15<sup>th</sup> bullet).
- WB13)** Stabilize shoreline and hillside at 8587 Wesleyan Lane, North Webster to reduce sediment loading. (TAC, 2009) – **NEW AREA**
- WB14)** Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**



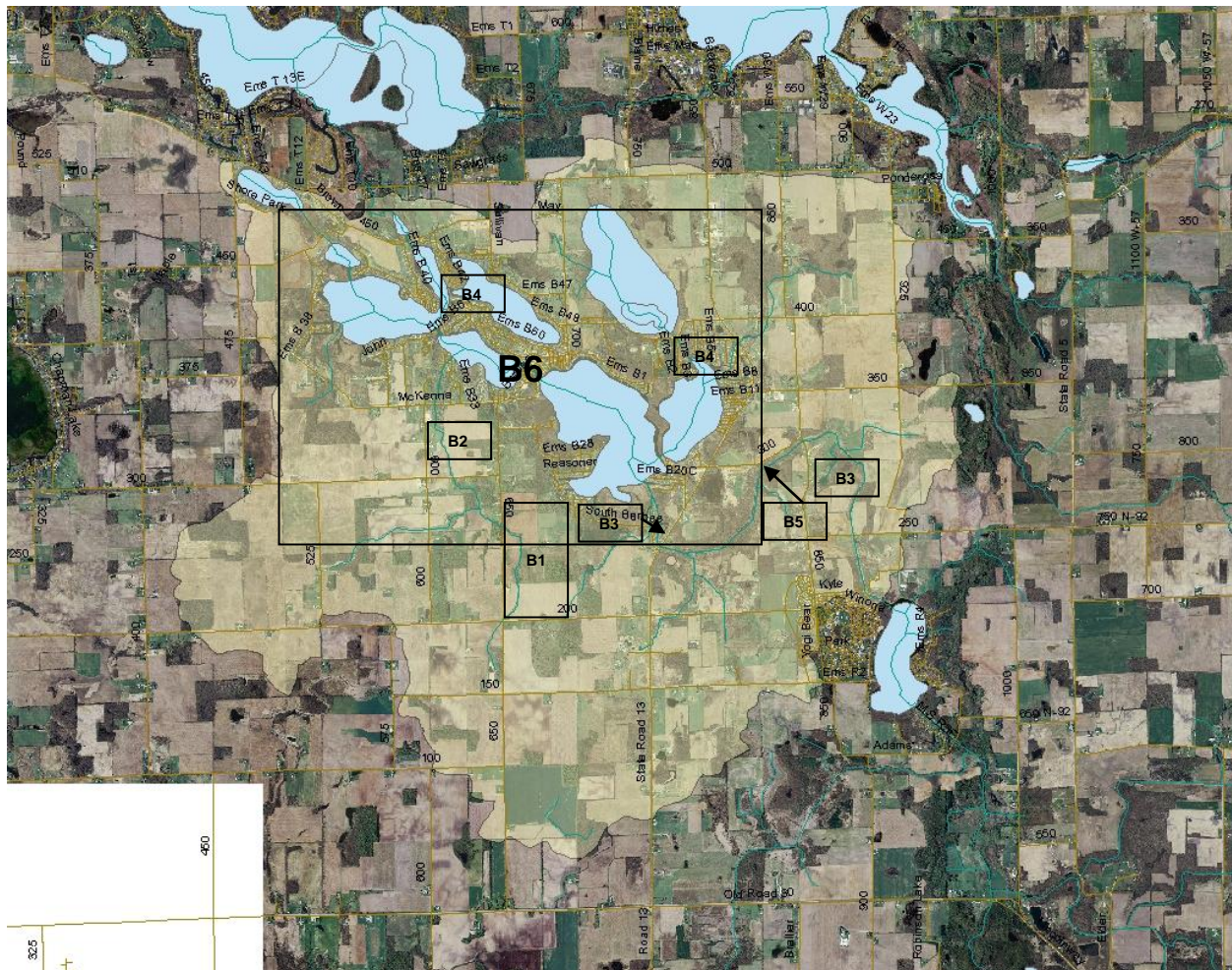


Webster / Backwater Subwatershed Critical Areas



## Barbee Lakes Subwatershed (HUC 051201060104) (WMP2006 p5.91)

- B1)** Install buffer strips east of County Road 650 E. (New, 2000) (3<sup>th</sup> bullet).
- B2)** Create wetland south of McKenna Road (New, 2000) (4<sup>th</sup> bullet).
- B3)** Create wetland or bioretention practice to manage run-off from drains east of State Road 13 and west of Big Barbee southern channel to remove road runoff and petroleum products (New, 2000) (5<sup>th</sup> bullet).
- B4)** Create wetland or bioretention practice to manage run-off from drains near Sechrist and Kuhn Lakes (New, 2000) (6<sup>th</sup> bullet).
- B5)** Restore wetland north of CR300N and east of CR650E. (TAC, 2009) – **NEW AREA**
- B6)** Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**

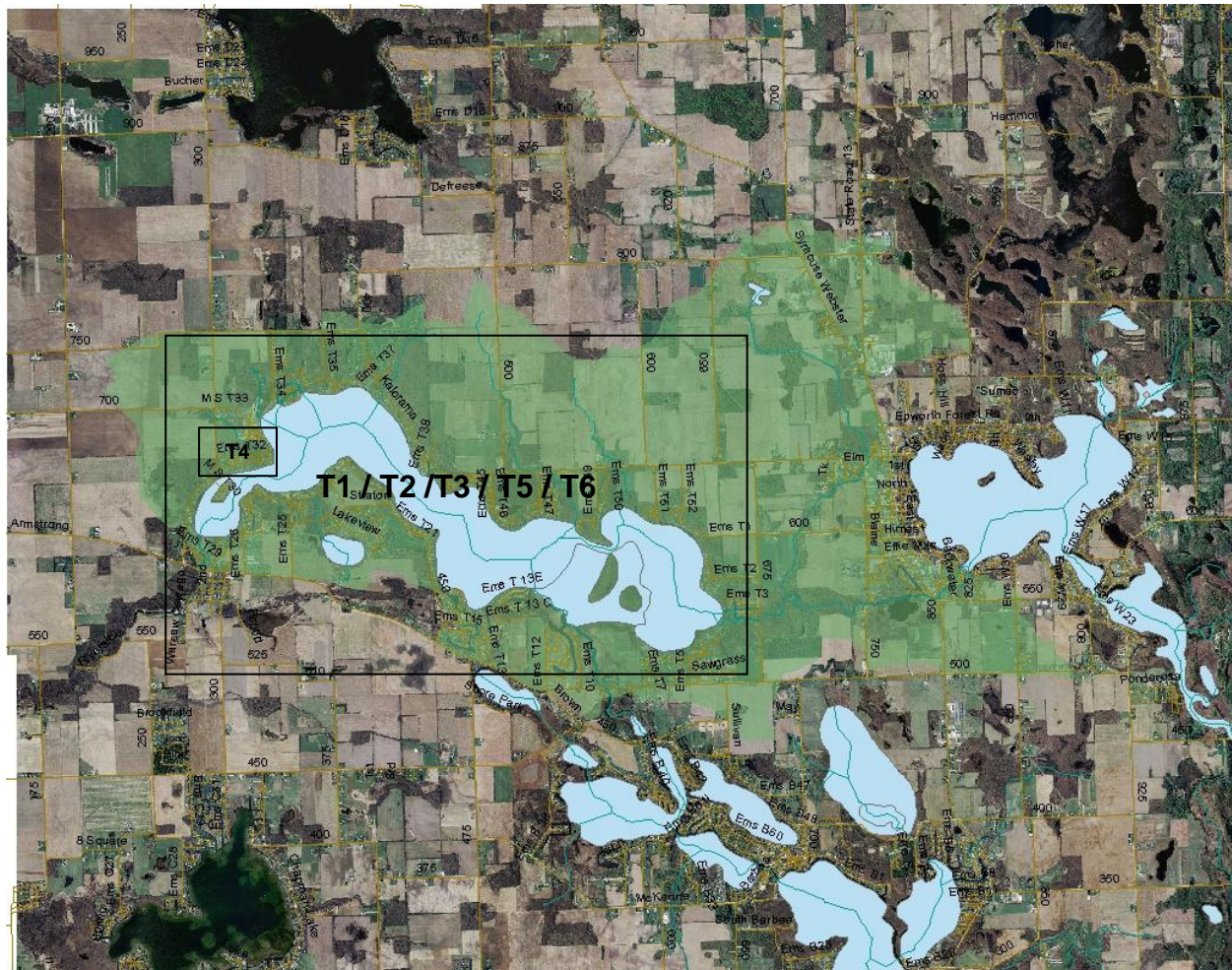


Barbee Lakes Subwatershed Critical Areas



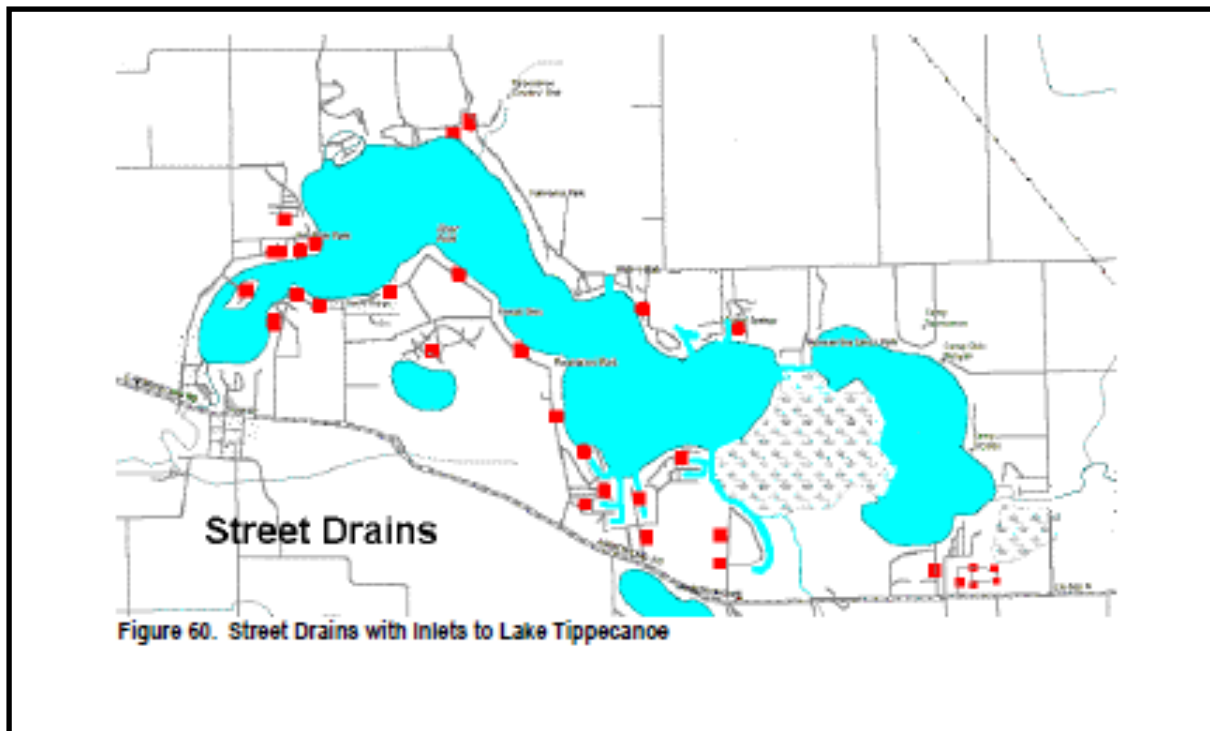
## Lake Tippecanoe Subwatershed (HUC 051201060105(western portion)) (WMP2006 p5.93)

- T1) Install comprehensive sanitary sewer system in residential areas surrounding the lake. (New, 1997) (1<sup>st</sup> bullet).
- T2) Reduce sediments and nutrients from the 35 street drains around the lake (Figure 60 below)(Bright, 2005) (3<sup>rd</sup> bullet) - *Modified to allow the use of other BMP's.*
- T3) Encourage or cost share with local residents to incorporate rain gardens into their landscapes (Bright, 2005) (4<sup>th</sup> bullet).
- T4) Generate local consensus, design, and build two community rain gardens to manage storm water runoff in Bell Rohr Park and Russell Park neighborhoods. The land is already owned by the associations, so no additional land acquisition is needed (Bright, 2005) (5<sup>th</sup> bullet).
- T5) Seek design and implementation funding for other storm water BMPs as outline in Table 49 pg.5.95 of the 2006 TWF WMP. (Bright, 2005) (6<sup>th</sup> bullet)
- T6) Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**



Lake Tippecanoe Subwatershed Critical Areas

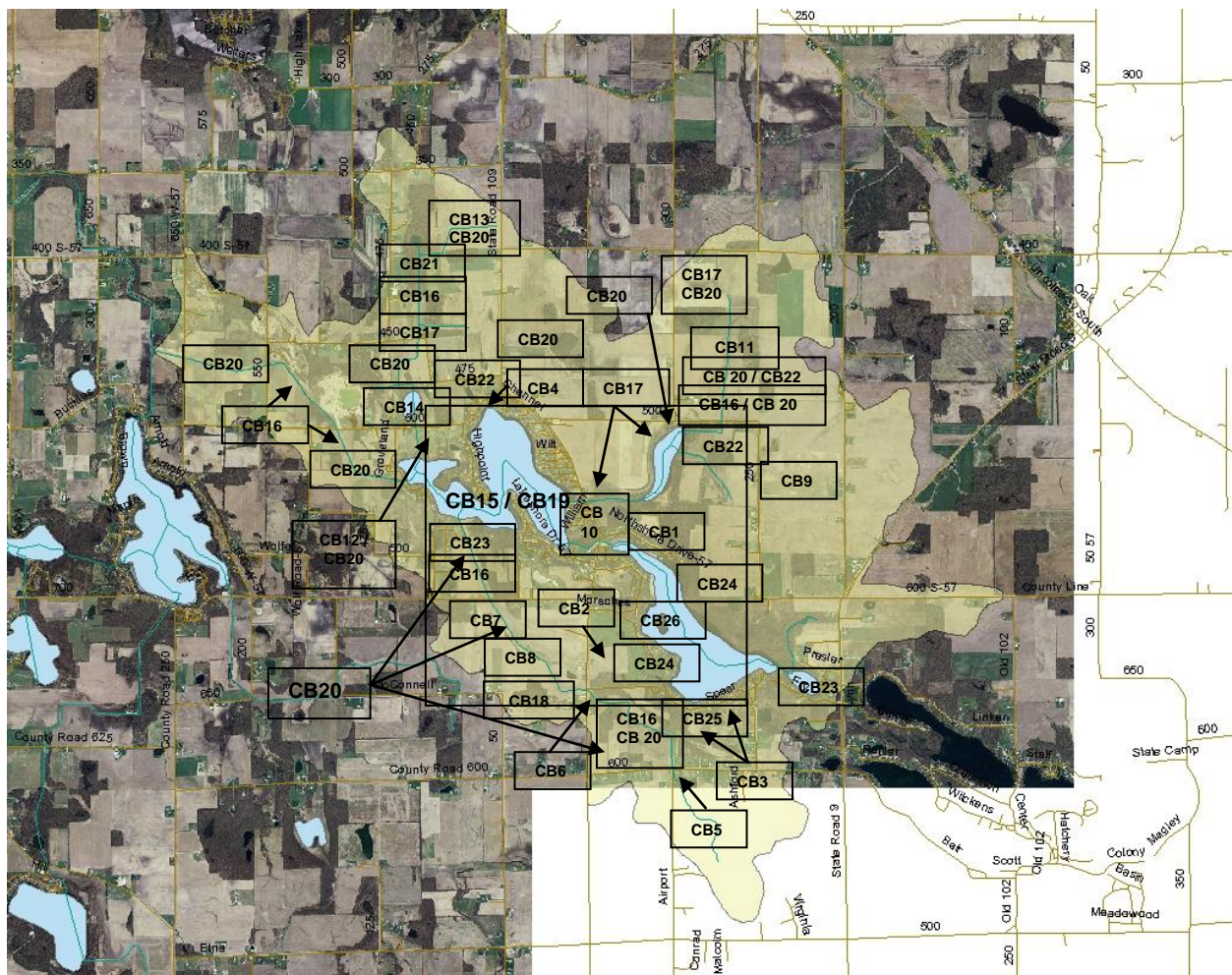




**Crooked / Big Subwatershed (HUC 051201060103(eastern portion)) (WMP2006 p5.96) \*(In the 2006 WMP, priority areas identified the Smalley Watershed's critical areas list were actually in the Crooked / Big Subwatershed)**

- CB1)** Incorporate measures to slow the water and sediment loss above the ravine (Tall Trees Memorial Grove) outside of the Nature Preserve (Crisman, 1993) (2<sup>nd</sup> bullet).
- CB2)** Enlist the agricultural field on south side of golf course in the conservation tillage program (Crisman, 1993) (3<sup>rd</sup> bullet).
- CB3)** Enlist the agricultural field located south of lake near Spear Road in the conservation tillage program (Crisman, 1993) (4<sup>th</sup> bullet).
- CB4)** Decrease sediment at the outlet of Stuckman Drain, and stabilize the banks (IDNR, 1995). (5<sup>th</sup> bullet). - *Modified to allow the use of other BMP's.*
- CB5)** Decrease sediment on Sell Branch immediately upstream of County Road 600 N. along Airport Road (IDNR, 1995) (6<sup>th</sup> bullet). - *Modified to allow the use of other BMP's.*
- CB6)** Decrease sediment 600 feet upstream of State Road 109 in Sell Subwatershed (IDNR, 1995) (7<sup>th</sup> bullet). - *Modified to allow the use of other BMP's.*
- CB7)** Decrease sediment immediately upstream of County Line Rd in Sell Subwatershed (IDNR, 1995) (8<sup>th</sup> bullet). - *Modified to allow the use of other BMP's.*
- CB8)** Install filter strips within the Sell branch Subwatershed (IDNR, 1995) (9<sup>th</sup> bullet).
- CB9)** Install filter strips on cropland east of County Road 250 W in Crane Subwatershed (IDNR, 1995) (10<sup>th</sup> bullet).

- CB10) Reforest land along the southern bank of Crane Ditch (IDNR, 1995) (11<sup>th</sup> bullet).
- CB11) Decrease sediment upstream of County Road 500 S. in Crane Subwatershed (IDNR, 1995) (12<sup>th</sup> bullet) - *Modified to allow the use of other BMP's.*
- CB12) Increase the acreage of land committed to conservation set aside to the southeast of Green Lake and south of County Road 500 S (IDNR, 1995). (13<sup>th</sup> bullet) - *Modified to allow the use of other BMP's.*
- CB13) Vegetate or reforest land between Haroff Lake and SR109. (IDNR, 1995) (14<sup>th</sup> bullet) - *Modified to allow the use of other BMP's.*
- CB14) Install filter strips on the north side of County Road 500 S (IDNR, 1995) (15<sup>th</sup> bullet).
- CB15) Continue in-lake water quality testing for phosphorus, nitrate, and turbidity and consider limited tributary samplings (IDNR, 1995) (16<sup>th</sup> bullet).
- CB16) Restore riparian zones along the Tippecanoe River and its tributaries where possible; minimally, install filter strips along the Tippecanoe River and its tributaries. Target areas shown on subwatershed map first. (JFNew, 2004) (*Smalley Watershed 3<sup>rd</sup> bullet*).
- CB17) Restore as many wetlands as possible in the Smalley Lake watershed, focusing first on the Tippecanoe River subwatershed and targeting those areas shown on subwatershed map first. Watershed stakeholders should try to restore wetland acreage so that the percentage of the watershed covered by wetlands equals or exceeds the percentage of land in the greater Upper Tippecanoe River basin that is covered by wetlands (JFNew, 2004). (*Smalley Watershed 4<sup>th</sup> bullet*).
- CB18) Plant vegetative filter areas around unprotected risers shown on subwatershed map first. (JFNew, 2004) (*Smalley Watershed 9<sup>th</sup> bullet*).
- CB19) Reduce phosphorus and sediment inputs from high density residential and commercial areas through installation of rain barrels, rain gardens, and riparian/shoreline buffers. (TAC, 2009) – **NEW AREA**
- CB20) Install buffer strips along the Tippecanoe River and its tributaries. Target areas shown on subwatershed map first. (*UTRLA WMP p.117,118 and Fig 56,57*) – **NEW AREA**
- CB21) Work with landowner adjacent to Haroff ditch near CR 475 to develop a nutrient management plan. (*UTRLA WMP p.117,118 and Fig 56,57*) – **NEW AREA**
- CB22) Install grassed waterways along the Tippecanoe River and its tributaries. Target areas shown on subwatershed map first. (*UTRLA WMP p.117,118 and Fig 56,57*) – **NEW AREA**
- CB23) Construct a sediment trap or two stage ditch on Sell Ditch upstream of Big Lake and upstream of Little Crooked Lake. (*UTRLA WMP p.117,118 and Fig 56,57*) – **NEW AREA**
- CB24) Address grade stabilization issues on the northeast and southwest sides of Crooked Lake. (*UTRLA WMP p.118 and Fig 56,57*) – **NEW AREA**
- CB25) Construct bioretention filter along the southern inlet to Crooked Lake. (*UTRLA WMP p.118 and Fig 56,57*) – **NEW AREA**
- CB26) Stabilize the shore of the island located in the western portion of Crooked Lake. (*UTRLA WMP p.118 and Fig 56,57*) – **NEW AREA**



### Crooked / Big Subwatershed Critical Areas